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AUGUST 26, 1950

SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE



Solution to Schistosomiasis

See Page 131

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Compact industrial television system—developed at RCA Laboratories—lets us see the unseeable in safety!

Eye-witness reports from a fiery furnace!

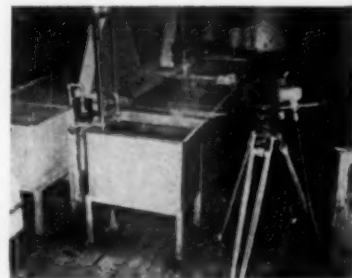
Something's gone wrong in a big blast furnace, and heat is too high for engineers to approach. Focus the Vidicon camera of an RCA Industrial Television System on the flames and the fiery furnace can be studied in comfort on a television receiver.

This is only one suggested use, for RCA's compact industrial television system is as flexible as its user's ingenuity. "Eye" of the tiny camera—small enough to be held in one hand—is the sensitive Vidicon tube. Extremely simple, the only other equipment

needed is the Vidicon camera's suitcase-size control cabinet, which operates anywhere on ordinary household current.

The Vidicon camera could be lowered under water where divers might be endangered—or stand watch on atomic reactions, secure from deadly radiations. And it is practical to arrange the RCA Industrial Television system in such a way that observers can see a 3-dimensional picture . . . sharp, clear and real as life!

See the latest wonders of radio, television, and electronics in action at RCA Exhibition Hall, 36 West 49th St., N. Y. Admission is free. Radio Corporation of America, Radio City, New York.



Here's RCA's Vidicon system at work beside a steaming vat. Note how the television camera is getting a safe "close-up" of the action.



RADIO CORPORATION of AMERICA

World Leader in Radio — First in Television

PUBLIC HEALTH

Weapon against Snails

Chemicals are discovered that may conquer schistosomiasis, number three health problem of world, by wiping out snail hosts of fluke parasite.

See Front Cover

► **CHEMICALS** that may conquer the world's Number Three health problem have been discovered by scientists of the U. S. Public Health Service's National Institutes of Health in Bethesda, Md.

The chemicals are snail-killers. They may stop schistosomiasis, a disease that attacked nearly 2,000 of our fighting men during the invasion of Leyte in World War II. Our forces in Korea now may be in danger of getting this snail-spread disease, though exact information on this is lacking.

Schistosomiasis is caused by a kind of flat, leaf-shaped worm called a fluke. The fluke spends part of its life cycle in the body of certain fresh water snails. Humans who bathe, drink, wade or do laundry in water containing these snails or the larval form of the flukes are likely to get the disease. The flukes produce their eggs in the human body. These get back into the water either directly from humans using the water or via drainage from land fertilized with human night soil.

The cycle can be broken and the spread of the disease stopped by getting rid of the snails. The chemicals that show promise of doing this are sodium pentachlorophenate and copper pentachlorophenate. They have been used in the textile and wood industries and elsewhere. Their snail-killing power was discovered in World War II-sparked studies at the National Institutes of Health.

Excellent results with them in field trials in swamps, lily ponds, roadside ditches and backwash river waters in Puerto Rico are now announced by Drs. Elmer G. Berry and M. O. Nolan of the U. S. National Institutes of Health and Dr. J. Oliver Gonzalez of the School of Tropical Medicine at San Juan, P. R. Dead snails on lily ponds after spraying are shown on this week's cover of *SCIENCE NEWS LETTER*.

Four other chemicals proved effective in the field trials, but their present price makes them impractical for this use. The two most promising ones cost about 20 cents a pound. Even shipping charges half way across the world will not bring this up much. Copper sulfate, the chemical previously used in the fight against schistosomiasis, costs 22 cents a pound delivered in Egypt.

Copper sulfate has to be applied to snail and fluke-infested waters every two or three months. Even then it does not give very good results. The two phenate chemicals probably will have to be applied only once or twice a year.

To determine just how often they must

be used and how often infected snails come back to the treated waters, Dr. Berry is going to Liberia to conduct more field trials.

Further tests of the safety of the chemicals will also be made. They kill catfish, guppies and eels, but not crayfish, the Puerto Rico trials showed. So far as now known, the chemicals will not harm humans or cattle drinking or bathing in the water. Further tests with rats and guinea pigs in the laboratory are now under way.

Schistosomiasis is the world's number three health problem, coming after malaria and tuberculosis, for two reasons, Dr. Willard H. Wright, head of the tropical diseases division of the U. S. National Institutes of Health, explained.

One is the number of persons affected, estimated at 115,000,000 persons throughout the world. In Egypt 75% to 80% of the population are infected and the disease is estimated to reduce the economy and production of the country by one-third.

Second reason is that the disease is a chronic one which makes its victims too sick and weak to work. And there is no good remedy for it. Tartar emetic, an antimony compound, is fairly effective when

given early in the disease to patients who can be protected from reinfection. But this is practically impossible for large numbers of people in Egypt, the Orient and some South American countries who have no sewage and water supply systems and must use ponds and streams for everything from drinking to laundry and irrigation.

Patients may be sick with the disease for anywhere from three months to more than two years and eventually die of it. Symptoms may vary from itching of the skin where the fluke larvae enter to fever and severe generalized pain. The eggs of the flukes are often deposited in the bladder and become the nuclei for the formation of bladder stones. Cancer of the bladder is believed also to result from this disease.

Science News Letter, August 26, 1950

PSYCHOLOGY

Homing Pigeon's Rival: Bermuda Lobster

► **THE HOMING** pigeon's latest rival is the Bermuda spiny lobster.

That lobsters are fully "aware" of their location and can return to their original feeding grounds when released elsewhere was discovered by Dr. Edwin P. Cresser and Dr. Dorothy Travis when they were at the Bermuda Biological Station.

They recovered about 20% of the lobsters released at various sites. This indicates, they conclude in the journal *SCIENCE* (Aug. 11), that they are probably dealing with a remarkable homing instinct.

Science News Letter, August 26, 1950



TESTING—To find out how much chemical to apply to kill the snails in this stream in Big Creek, Los Pena, Puerto Rico, Dr. Elmer G. Berry is testing the current.

SEISMOLOGY

Record Quake in Assam

➤ ONE of the "greatest earthquakes in history," possibly causing considerable loss of life, occurred in the same region where, in 1897, the strongest earthquake ever reported also occurred.

This is the region of the northern Burma, China and Assam province border, made famous during World War II by the Burma Road. The epicenter of the earthquake has been set at 28 degrees north latitude and 97 degrees east longitude, the Coast and Geodetic Survey reported and is accurate within one degree.

Exact number of lives lost and amount of damage caused is still to be determined because of communications difficulties from that area. It may take weeks to learn the full extent of damage.

The earthquake was scaled at a magnitude of 8.4. Top of the scale, based on the worst earthquakes of the past, is 8.5. The 1897 quake occurred before instruments were used to record magnitudes, but seismologists credit it with being the strongest on the basis of reports at that time.

The explanation of why we have earthquakes is relatively simple, but predicting when and where they will strike cannot be done with any accuracy.

The solid, rocky crust of the earth is always in a state of strain and is acted upon by shifting forces. When the rocks shift a little to relieve the strain, they cause an earthquake. The waves set up by this earthquake in the rocky material of the earth spread out like ripples from a stone in a pond and are detected on delicately balanced seismographs half way round the world.

Science Service helped to locate this earthquake by passing coded telegraphed

information from the many institutions that record information on their seismographs to the Coast and Geodetic Survey in Washington, D. C., for computation of the quake's epicenter.

Science News Letter, August 26, 1950

METALLURGY

Slag-Fuming Recovers Metal from Smelter Waste

➤ RECOVERY of strategic metals, such as lead and zinc, from waste piles at smelters by a wartime process known as slag fuming is proving a success and a third installation is now being made.

The waste piles are the heaps of slag from ore-bearing rock, the material that remains after ordinary smelting operation has been carried as far as economically possible. This slag, or tailings as it is sometimes called, still contains considerable metal and salvage of the metal is particularly important where known deposits of the ore are becoming depleted.

The fuming operation, as described by D. V. Sherban of the Babcock and Wilcox Company, is a process in which zinc or lead, in the form of vapor or fumes, is boiled or "fumed" up from the surface of a furnace-load of molten slag. The vapor is converted into a metallic oxide which is cooled as a solid, or as a powder known as "fume," for further processing into finished metal.

Three installations for slag-fuming have been made in North America, Mr. Sherban states. His firm has worked closely with the smelting industry in developing and manufacturing the equipment for this purpose.

The first was made in 1943 at Kellogg,

Idaho, by the Bunker Hill and Sullivan Mining Company. The second was made in Texas at El Paso for the American Smelting and Refining Company and went into operation about two years ago.

The latest installation is near the Arctic Circle at Flin Flon, Manitoba, where the Hudson Bay Mining and Smelting Company has an 800,000-ton accumulation of residue estimated to contain 26% of zinc alone.

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POPULATION

Squeeze on Work Ages

At one end of age scale there is pressure from oldsters who now number 13 for every 100 between 20 and 64. At other end are nation's war and postwar babies.

► FOR the next 10 years or so the people of this nation who are at the main working ages, 20 to 65, will be having the squeeze put on them.

At one end they are confronted with the rapidly growing number of oldsters in our population. There are 13 people over 65 for every 100 between the ages of 20 and 64. Authorities from all over the land conferred on this problem at the recent Conference on Aging in Washington, D. C.

At the other end is coming the squeeze from the nation's war and postwar babies. Right now there are about 54 children under age 18 for every 100 persons between 20 and 64. That is half the ratio it was 100 years ago when we had 107 children under age 18 to every 100 between ages 20 and 64.

But the downward trend in ratio of children to the population at the main working ages has been reversed.

Due to the war and postwar spurt in the birth rate, the child population has increased at a more rapid rate than people at

ages 20 to 64. This will continue for at least a decade even if allowance is made for a steady decline in the birth rate from its present level and at the same time the population at the older ages continues its long-term upward climb.

One way the squeeze could be at least partly eased received the attention of the delegates to the Conference on Aging. This is to make better use of many of the oldsters who ordinarily retired at age 65. During the manpower shortage of World War II, many men and women over 65 went back to jobs they had given up to younger persons. Some of them had physical handicaps, but that did not keep them from doing a job.

If the present manpower situation becomes acute, many of them may go on working or return to work regardless of being over age 65.

To keep the oldsters healthy was another of the problems engaging attention from some of the delegates. Our medical men for many years concentrated on keeping babies

alive and keeping children well. More and more of them now, in research laboratories and in office and clinic, are working to keep old people healthy and active. The increasing numbers of youngsters may give the push needed to keep the older persons working for more years. And for many of them this in itself will be a health measure.

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PSYCHOLOGY

Thyroid May Control Ability to Taste

► YOUR ability to taste may have some connection with how your thyroid, the U-shaped gland in the neck, functions.

This suggestion comes from Dr. William C. Boyd of U.S. Naval Medical Research Unit No. 3 in Cairo, Egypt. He bases it on taste tests with an anti-thyroid chemical, 1-5-vinyl-2-thioxazolidone. The chemical is related to the more familiar anti-thyroid drugs, thiourea and thiouracil. It has only recently been isolated and occurs widely in nature, especially in turnips and cabbage.

Tests were made of the antithyroid chemical on 21 persons. They had previously been tested for ability to taste PTC, or phenylthiocarbamide. About 25% of most populations cannot taste PTC at all, while the others find it quite bitter.

The persons in Dr. Boyd's study who could taste PTC could all taste the anti-thyroid drug, while those who could not taste PTC also could not taste the anti-thyroid chemical.

PTC is a synthetic chemical. Ability to taste it is hereditary. How and why there should be in some persons a gene giving ability to taste a compound which does not occur in nature is hard to understand, Dr. Boyd points out (SCIENCE, Aug. 4). The connection with thyroid function seems to give a clue to the reasons.

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PSYCHOLOGY

Ping-pong Ball Goggles In Vision Experiment

► GOGGLES made from the two halves of a ping pong ball are creating an artificial world of fog for those taking part in vision experiments in the psychology laboratory at Cornell University in Ithaca, N. Y.

Looking through the ping pong goggles, the subject can see brightness or darkness but he can not perceive the texture of surfaces. It is as though he were enveloped in a fog.

Dr. James J. Gibson, professor of psychology at Cornell, is using this device to test his new theory of how we perceive depth. He believes our perception of depth and distance is due to our manner of seeing textures or surfaces of objects. The experiments are being conducted for the U. S. Air Force.

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SEEING IN A FOG—Wearing goggles made from ping-pong balls, research assistant Walter L. Carel, of Cornell University, is discovering what vision is like when brightness and darkness can be perceived but not the texture of surfaces. Dickens Waddell is acting as observer.

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NUTRITION

From Now On: Vitamins

Food factors such as B₁₂ promise to not only bring better health to the sick but also to help farmers grow more meat faster and cheaper.

By WATSON DAVIS

Twenty-second in a series of glances forward in science.

➤ IS it more wonderful to rescue those dying of pernicious anemia or to give the farmer a means of growing more meat faster and cheaper in order to feed more people?

One of the latest vitamins, twelfth in the B series, does both—and more.

In 1926 one of the great discoveries in medicine was made by Minot, Murphy and Whipple—made Nobelists for their achievement—that eating of liver relieves the symptoms of this blood disease. The effective chemical in the liver, or at least one of them, turned out to be a red crystalline material, which was called vitamin B₁₂. It is, on a weight basis, we are assured, the most potent therapeutic compound known to medicine.

The conquest of any human disease, even in these days of many such achievements, is notable. But the possibilities of the use of this B₁₂ substance in raising food are even more exciting commercially and agriculturally.

For putting weight on hogs and making chickens grow and produce eggs, some food of animal origin, such as fish meal, skim milk, etc., has long been known to be desirable. It contains what is called APF, or animal protein factor. The vitamin B₁₂ seems to substitute for APF to a large extent and it is being used in animal feeding, converting an all-vegetable diet into the equivalent of the one that contains animal proteins.

The same microorganism that produces streptomycin, one of the four most successful antibiotic disease fighters, can be made to yield B₁₂ as the result of fermentation. Thus the supply of the vitamin is no longer dependent upon animal production.

Even little children who are under par in school ask for second helpings and improve in vigor, alertness and general behavior when fed very small amounts of B₁₂. It may put weight on our population as well as provide more food for our youngsters to eat.

In the intensive search for things to give a growth kick to animals being raised on our farms, it was discovered just a few months ago that one of the other new medical antibiotics, aureomycin, can team up with B₁₂ in the feed to give a cheaper protein supplement. Aureomycin and B₁₂ used together make the pigs and chicks grow even faster than B₁₂ alone.

Even more recently a third compound, a derivative of arsonic acid, was discovered by the U. S. Department of Agriculture to give an additional impetus to growth.

What happens in animals is likely to apply equally well to human beings. These newer supplements can be expected to affect human medicine and well-being as well.

Such complex and involved developments in nutrition as the recent history of B₁₂ and related substances assures us that there is still much more to be learned about the food we eat and give our animals.

In the future, we may expect:

A. Additional food factors perhaps in the B vitamin family will be discovered, with the consequence that diseases will be countered and nutrition will be improved.

B. Parts of the world where foods of animal origin are scarce and costly will benefit in the near future from these newly discovered factors in food, just as the longer recognized A, D, C and B₁ vitamins have vastly improved the fare of millions.

C. In our own agricultural economy, more high-grade protein food production, such as meat, will be possible in the near future through use of soybeans, cottonseed meal, and wheat middlings supplemented by B₁₂ and similar non-animal factors.

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ENGINEERING

Coal Gains in Electric Field, Loses in Others

➤ COAL, which has lost ground to fluid fuels in many heating and power jobs, has been growing in importance yearly in the electric power utilities.

This field represents the form by which coal can best compete with the fluid fuels, according to Bertrand A. Landry of Battelle Memorial Institute, Columbus, Ohio.

How coal is losing out in other fields to liquid fuels and natural gas was pointed out by him at the Annual Midwest Power Conference held by the Illinois Institute of Technology. Among other matters he discussed necessary steps to improve coal's position.

Reasons for the decline in coal's relative position were given by him as its increasing price, the greater convenience of fluid fuels, the interruptions to day-to-day supplies due to strikes, and the rising standards with regard to air pollution.

The questions of convenience and of air pollution can be met in part at least. Re-

search and development have shown, in recent years, that substantial improvement over conventional methods of handling and of burning coal and of disposing of ashes could be achieved, he stated.

Research and development over the last 10 years, he added, has established that domestic equipment can be designed and manufactured in which coal can be burned nearly smokelessly for domestic heating. The application of overfire air jets to boiler furnaces has also been studied and rationalized.

Coal seems to be the preferred fuel in the electric power utilities, he indicated. The total consumption for electricity is now twice what it was in 1939, he declared. Over 40,000,000 tons more coal is now being required yearly to meet this increase. Greatly added tonnage will be needed for electric plants under construction and for other plants that will be required in the future to satisfy the increasing demands for electricity.

"It is, therefore, definitely to coal's advantage to promote the use of electricity in all its varied applications," he asserted. These applications stretch from running giant electric motors to minor household gadgets, and might include clearing sidewalks of snow and ice.

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PHYSICS

Atomic Cloud Height Figured from Cumulus Data

➤ HOW high an atomic cloud will rise can be figured from data applicable to any ordinary, much less dangerous cumulus cloud. By doing this, Dr. Lester Machta of the U.S. Weather Bureau has figured that the original Los Alamos atomic cloud rose 39,800 feet.

A cloud rises because it is warmer than the surrounding air and it stops rising because it cools, both by expansion and by the entrance of outside air into the cloud.

An atomic cloud does a super cooling job. It starts out at least 1,000,000 degrees centigrade and almost instantly cools down to about 3,000 degrees centigrade, by radiation. Then the usual meteorological effects take over.

The heat of the cloud brings in tremendous amounts of air and at the same time the cloud expands. As this is going on, the cloud rises, getting to 30,000 feet in about eight minutes.

By that time it is almost as cool as the surrounding air and shortly thereafter, when its temperature equals the surrounding air, it stops.

Dr. Machta, in the BULLETIN OF THE AMERICAN METEOROLOGICAL SOCIETY (June), has figured out the height to which an atomic cloud would rise, using mathematical formulae based on the cooling rate of an ordinary cloud.

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INVENTION

Inventors Aid Government

Electronic experts are tackling the problem of preventing jamming of Voice of America broadcasts. Top problems are listed by National Inventors Council.

► INVENTORS of the nation are rushing to help solve the problems of rebuilding America's war machine, as they did during World War II.

The first big job that has been tackled in the last few months under the stimulus of the National Inventors Council is countering the jamming of the Voice of America broadcasts by the Soviets.

More than 60 top electronic experts have been working for the past six months on this situation at the joint request of the Department of State and the National Inventors Council. Details of progress have not been announced, but as a result the American radio messages should soon be getting through to the Russian people with more reliability.

The Korean situation has doubled the number of suggestions being received at the Department of Commerce by the National Inventors Council, headed by Dr. Charles F. Kettering, General Motors consultant. At present, ideas and inventive suggestions are being received at the rate of 8,000 a year. During World War II a total of 250,000 were received and evaluated by this voluntary but official committee of leading engineers and scientists.

The National Inventors Council is an open door for inventors who wish to present ideas to help the war effort. In addition, the Council issues on behalf of the armed services technical problems for which solutions are needed.

Among the new problems issued are:

A tool for the rapid splicing of military field wire, under adverse weather conditions and darkness.

A light-weight gasoline vehicle that can operate over snow.

Machinery for fabricating and welding titanium.

An adhesive that can stick explosive to a vertical surface for two months even when as cold as 40 degrees below zero.

An automatically coupling joint for bridges.

Foam that can be produced in the field to fill canvas tubes for buoyant floats.

Methods for discharging ships rapidly on the beach or dock.

A substitute for down and feathers for use in arctic sleeping bags.

Machinery for burrowing a large tunnel through packed snow or ice.

A personal heating system.

Practical method of destroying tell-tale tracks of men or vehicles over snowfields.

A way of transporting supplies over glaciers.

A way of making snow, bogs, marshes, ponds and frozen soil solid for use as roads, airfields, etc.

Inexpensive method of rapidly turning snow and ice into drinking water.

Rubber and other materials that keep their usefulness at temperatures from 65 degrees below zero to 160 degrees above.

Device for protection of head and nose against extreme cold.

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AGRICULTURE

Cobalt Speeds Up Hog Fattening

► COBALT, the mystery mineral of better nutrition, has been shown in Fargo, N. D., to produce the same speed-up in the fattening of hogs as has been found in sheep and cattle.

Significant because swine have a different stomach system from ruminant animals such as cows and sheep, experiments by four scientists at North Dakota Agricultural College have furnished a new link between cobalt and vitamin B-12 and new evidence in the stepped-up study of the so-called "trace elements" in the food which animals—and humans—eat.

Pigs fed tiny amounts of cobalt in carefully-controlled diets put on more weight, and put it on faster, than pigs not having the added mineral, Drs. Earle W. Kloster-

man, W. E. Dinusson, Earl L. Lasley, and M. L. Buchanan report in the journal, *SCIENCE* (Aug. 11).

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PSYCHOLOGY

Device Tests Afterimages Even in Children

► IF YOU look fixedly at a bright colored object, for some time afterwards you may see a shadowy image of the object in contrasting color, known to psychologists as a negative afterimage.

To observe these afterimages scientifically and report their appearance and disappearance has required a good deal of intelligence, reliability and special training.

Now a device has been invented to test for afterimages so simply and objectively that it can be used even with children or mentally disturbed patients, Dr. H. Lehmann, of Verdun Protestant Hospital, Montreal, Can., reports (*SCIENCE*, Aug. 18).

The person seeing the afterimage is not even aware of seeing the original colored object that produces the afterimage, Dr. Lehmann says.

The device is a disk, half white and half black with a pie-shaped piece cut out of the black section. When this is spun rapidly in front of a red circle, the rotating disk will appear to the observer to be green. Because of the spinning he will not see the black or white separately, and neither will he be aware of seeing the red circle behind the cut away notch.

By regulating the intensity of the light by polaroid filters, Dr. Lehmann was able to determine at what degree of brightness the afterimage was visible—that is, when the rotating disk appeared green—and at what intensity the observer noticed the original color, red.

Science News Letter, August 26, 1950



FOR ATOMIC BOMB DEFENSE—All the instruments needed to detect and measure radioactivity are mounted in this truck-carried laboratory. In case of explosion, this mobile laboratory could speed to the scene to test for radiation, identify type of rays, and measure danger. It is built by Radiation Counter Laboratories, Inc., of Chicago.

PHYSICS

Atomic Energy Use for Hot Liquid Metals

► A PREVIEW of some of the hottest handleable liquids in the world—some of them metals that become liquid at more than a thousand degrees Fahrenheit—that might be used in atomic energy power plants has been issued by the Atomic Energy Commission and the U.S. Navy.

Some of the metals surveyed in a new liquid metals handbook are familiar ones in solid form: Aluminum, lead, magnesium, tin and zinc. One is usually seen as a liquid: mercury. Others less familiar are: Antimony, bismuth, cadmium, cesium, gallium, indium, lithium, potassium, rubidium, sodium, and thallium.

Now used in carrying heat to kettles in which chemicals are manufactured, reheating steam in power plants, and controlling mold temperatures, liquid metals would be one method of carrying the heat from the atomic reactors to engines where it could be used for power generation.

Science News Letter, August 26, 1950

ENGINEERING

New Subway Cars Have Constant Lighting

► LIGHTING for New York City's newest subway cars and the lighting system installed in the new Brooklyn-Battery traffic tunnel, which connects the city proper with Long Island, were described to the Illuminating Engineering Society meeting in Pasadena, Calif. Both are noteworthy installations.

Fluorescent lighting with the lamps operated on an uninterrupted alternating current, instead of on direct current from the third rail as now done, is the important feature in a new subway train in experimental use. The system employed is a development of Westinghouse Electric Corporation, and its features were described by E. W. Beggs and H. W. Graybrook, of Westinghouse.

Fluorescent lamps were developed for operation on alternating current, they said, and they operate more efficiently on it than on direct current. To obtain the alternating current from the direct current that operates the driving motors of the train, motor-alternators are used in each car.

But gaps in the third rail system that delivers the power to the train presented a difficulty. The track layout of the New York subway requires frequent gaps in the third rail. They provide interruption of the power to each car about 35 times per operating hour.

This difficulty was overcome in the new cars by adding flywheels to the motor-alternators. The inertia of the flywheel provides power to keep the lamps lighted across the longest gaps in the system.

Many features of the lighting system of the Brooklyn-Battery tunnel were described by Leo Geenens of the New York Triborough Tunnel Authority and Kirk M. Reid of General Electric. The lighting system comprises over 36,000 linear feet of luminaires.

To aid the lighting, side walls and ceiling have a white-tile finish and will be kept well washed. Important is a "daylight" entrance lighting that extends 1,800 feet in each tube. From bright lights in the first 400 feet, lighting is scaled downward through the rest of the 1,800 feet to provide easier adjustment of the driver's eyes.

Science News Letter, August 26, 1950

WILDLIFE

Drumming's New Method For Counting Grouse

► THE DRUMMING of the ruffed grouse, one of the most unusual sounds in nature, is being used experimentally as a census technique by the North Dakota Game and Fish Department.

In the past, the ruffed grouse census has been taken in the fall of the year by walking several miles in a number of study plot areas and recording the number of birds actually seen.

At present a roadside count method is being tried by driving a mile, stopping four minutes, and recording all drumming heard. The drumming sound can be heard for approximately a half mile and seems to be consistent from before sunrise to one to two hours afterward. So far this new technique has worked out very successfully.

The "drumming" sound for which the ruffed grouse is noted is not vocal but is produced by rapidly whirring wings in the air.

Science News Letter, August 26, 1950

VETERINARY MEDICINE

Pigs with Dished-In Faces Infectious to Other Pigs

► IF your pig has a dished-in face, off to the isolation ward with him. His ailment is infectious.

The peculiar disease which gives pigs this caved-in appearance is known as *atrophic rhinitis*. It causes certain bones in the face to disintegrate. Few pigs die from it, but it retards their fattening. Veterinarians know little about it.

Two Canadians, Drs. F. W. Schofield and T. L. Jones of Guelph, Ontario, say they have proved the disease is catching, however. They have not yet identified the infectious agent, they report in the JOURNAL OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION. But they say that isolation of infected pigs helps control outbreaks.

Science News Letter, August 26, 1950

IN SCIENCE

METEOROLOGY

Most of Nation Warmer Until Mid-September

► EXCEPT for the South Atlantic states and the Pacific Northwest, the country is in for warmer than normal weather until mid-September. The U. S. Weather Bureau's extended forecast says the South Atlantic states will have near normal temperatures and the Pacific Northwest will be slightly below normal.

Those above normal temperatures, at least in the eastern half of the country, will be accompanied by less rain than usual for the mid-August to mid-September period. The below-normal rainfall will extend to the South Atlantic states, too.

Most of Washington, Oregon and New Mexico will enjoy greater than normal rainfall, while the rest of the country will see rainfall in about the usual amounts for the same period.

The long range forecasters add that in most of the area from the plains eastward to the Appalachians, the weather from Aug. 15 to Sept. 15 should be warmer and drier than it was during the previous 30 days.

Science News Letter, August 26, 1950

AVIATION

Improved 'Chute Webbing Makes Jumping Safer

► IMPROVED webbing for parachute harness, developed at the Wright-Patterson Air Force Base, will make jumping safer and will save much money to the government because of the long life of the improved material.

The material is nylon webbing which has been treated with a resin, polyvinylbutyral. The resin does not penetrate the nylon fibers of the webbing, but it acts somewhat like an adhesive to prevent the fibers from separating and the webbing from fraying.

In the treatment process, the ribbon-like strands of nylon webbing strips are dipped into a water solution of the resin, commercially known as Merlon-BR, which has been dispersed in a wetting agent known as Duponal. The strips are then run through rollers similar to those on an ordinary washing machine. Excess water is removed but, more important, the resin is pressed into the webbing.

After drying in an oven, the strips are ready to be stitched into a harness for the parachute. The treated webbing is stiffer than untreated material, but this is a definite advantage in its wearing qualities.

Science News Letter, August 26, 1950

SCIENCE FIELDS

CHEMISTRY

Devices Give Pure Salt-free Water

► PURE salt-free water from the tides of the Hudson River or the industrially contaminated Susquehanna can be drawn in either household quantities or for large-scale factory use by means of devices announced recently by the Rohm and Haas Co. of Philadelphia.

More thorough-going than the type of water softener that keeps scale-forming and bath-tub ring salts in solution, these devices take all dissolved material out of the water supply, by means of a series of artificial resins known as amberlites. Two kinds of resins must be used at the same time. The new development for their use on an industrial scale consists of a separation procedure for renewing their activity when they become clogged. The procedure floats the lighter resin to the top of the container for treatment. Afterward air is forced in to mix the two materials again for use.

For household use the mixture of resinous particles is packed in a plastic tube to be attached to the water faucet, and a color indicator incorporated in the material tells when it is time to discard the water conditioning chemicals and install a new cylinder. A medium-sized installation which will provide pure water for automobile batteries, or for photographic developers, is also offered with a built-in current indicator to keep count of the purity of the treated water.

Science News Letter, August 26, 1950

ENGINEERING

Wheat Pumped Through Pipes like Water

► IN THE BARN of tomorrow, throw a switch and open a valve. Dry grain will come out of pipes like water.

This is the promise of experiments by engineers at West Virginia University. Whole-kernel wheat was substituted for pulverized coal in a compressed air "fluidizer" and blown through tortuous lengths of one-inch piping both efficiently and economically.

Air fluidization is a principle by which powdered coal and other finely-divided solids have long been moved through small pipes.

The same principle now makes conceivable an entire farm piped for push-button feeding of livestock and poultry. Results of initial tests are reported by Dr. Alfred D. Longhouse and D. P. Brown, agricultural engineers, and Dr. Howard P.

Simons and C. W. Albright, chemical engineers, in the technical journal AGRICULTURAL ENGINEERING.

Their studies were begun with borrowed coal equipment. Wheat was fed into the top of a tall, narrow cylinder. Compressed air was pumped in at the bottom. Fluidized grain was taken out a discharge pipe at the middle of the chamber.

Using air at only five pounds per square inch above atmospheric pressure, the researchers found that a ton of wheat an hour could be moved through a one-inch pipe 75 feet long. The delivery line had three right-angle corners and a U-turn in it.

Power required by the air compressor was less than three-eighths of one horsepower. By weight, one pound of air moved 20 pounds of grain. Even greater efficiency may be obtained if ground grain is fluidized in the same manner, the engineers say.

Science News Letter, August 26, 1950

PSYCHOLOGY

New Theory of Sense of Smell

► A NEW theory of how the sense of smell works has been developed by Dr. G. B. Kistiakowsky of Harvard University (SCIENCE, Aug. 4).

Odors work through enzymes, he believes. Enzymes are a class of chemicals which can produce the transformation of other chemicals. Many vital body processes go on through the mechanism of enzymes. Pepsin, a digestive enzyme, is one familiar example.

You get the odor of a chemical because it changes the concentration of one or more enzymes. The change in enzyme concentration produces a signal in certain nerves. The intensity of a smell is related, according to this theory, to the extent to which the enzymes are checked or blocked in their action.

The persistence of certain odors may be due to a non-reversible change in the blocking of enzymes, though most of the enzyme blocking is reversible.

Science News Letter, August 26, 1950

PHYSICS

Radio-Frequency Circuits Shed Light on Atom

► A NEW use for radio-frequency circuits is to determine the magnetic properties of the atom. Since atomic particles spin and carry electric currents they behave like small magnets.

Dr. Felix Bloch, professor of physics at Stanford University, reports new developments in the study of nuclear magnetism in the journal, PHYSICS TODAY (Aug.).

Placing these invisible magnets in an alternating magnetic field gives rise to electric forces which can be measured by short radio waves. New information about the

structure of matter has been discovered by varying the electric and magnetic forces to which atomic magnets respond, and measuring the time necessary for their response.

Science News Letter, August 26, 1950

PSYCHOLOGY

Flicker Frequency Found Related to Intelligence

► INTELLIGENCE may some day be measured by a flickering light instead of with the conventional paper-and-pencil mental tests.

The length of the dark period between flashes of light necessary for you to see the light as flickering and not continuous is determined by your central nervous system and not by your eyes.

New evidence of this is reported by Dr. Wilson P. Tanner, Jr., of the University of Michigan (SCIENCE, Aug. 18). He found that this "flicker frequency" is related to scores on intelligence tests. It may be possible in the future to measure ability to see light as flickering, instead of giving a paper-and-pencil test to measure intelligence, Dr. Tanner suggests.

A surprising discovery in the course of the experiment was the fact that the relation with intelligence varies with the length of the light flashes separated by the periods of darkness. It increases with increase in the length of the light flash, up to 84 thousandths of a second, and then decreases with further increase of the length of the light flash.

Science News Letter, August 26, 1950

NUTRITION

Vitamin Lack Kills Hens When They Start Laying

► IT IS not heart trouble that causes the non-infection deaths of hens about the time they start laying, but this loss to poultrymen may be linked to a deficiency of vitamin B₁ or potassium.

After a whole year of taking electrocardiograms of hens, which involved working out new methods, Dr. Paul David Sturkie, Rutgers professor of poultry physiology, found that heart ills killed only about 2½% of the normal hens, compared with about 25% deaths from unknown causes.

In another study, artificial diets lacking in vitamin B₁ and potassium did produce heart abnormalities in hens. Lack of vitamins A, D and G did not affect the heart, while too much potassium did.

Prof. Sturkie is now beginning a study of the blood pressure of hens as the next step toward solving the cause of this major loss in the poultry industry. Since the pulse rate of chickens is 300 to 400 a minute, too fast to count, electronic counting methods had to be developed.

Science News Letter, August 26, 1950

ASTRONOMY

Total Moon Eclipse

For nearly an hour, on Sept. 25, our satellite will be completely eclipsed by earth's shadow. The moon will shine with a dull red glow.

By JAMES STOKLEY

► THE GIANT JUPITER, largest member of the family of bodies, including the earth, that revolves about the sun, is the only planet visible during the month of September throughout the evening. The month is not without its attractions, however, for there is a total eclipse of the moon coming on Monday evening, Sept. 25. For nearly an hour our satellite will be immersed in the earth's shadow, shining with the curious coppery-red color characteristic of such an event.

Earlier on September evenings it will be possible to get a glimpse of the planet Mars in the constellation of Libra, the scales, low in the southwest as darkness falls. Mars sets about two and a quarter hours after the sun. It is about as bright as an average first magnitude star, but being so low when it appears, it is fainter than normal.

Jupiter, on the other hand, rises in the east about the same time that the sun is going down. It is therefore visible throughout the night. Its position in the constellation of Aquarius, the water-carrier, is shown on the accompanying maps. These depict the sky as it looks around 10:00 p. m. at the first of September, an hour earlier in the middle and two hours earlier at the end. (Add one hour if you are on daylight time.)

Vega Brightest

Turning to the stars which are self-luminous suns, quite different from the planets which shine by the light they reflect from our sun, we find that Vega, in Lyra, the lyre, is brightest. This shines high in the west. Not far from it and directly overhead at the times for which these maps are drawn, we see Cygnus, the swan. In this is the bright star Deneb, at the top of a group sometimes called the northern cross. The bottom of the cross points toward the southwest. Just below the star at the lower end, called Albireo, there is another of the first magnitude—Altair, in the figure of Aquila, the eagle.

Our other stars of the first magnitude, besides Vega, Altair and Deneb, are all low in the sky. Capella, in Auriga, the charioteer, is shown near the northeastern horizon, a harbinger of winter. Later in the night, as in the evenings of winter, it will climb high overhead. On the other hand, Arcturus, in Bootes, the bear-driver, is near the northwestern horizon, about to vanish for a while after having been promi-

nent in the evening skies of spring and early summer.

Low in the south we find the constellation of Piscis Austrinus, the southern fish. As shown in the imaginative pictures of the old star maps, it is represented as swallowing a stream of water falling from a jar being emptied by an old man in Aquarius, the water-carrier, just above. The southern fish contains the bright star Fomalhaut which will be seen in the evenings of the next few months, never rising much higher than it is now.

Mercury Seen

At the very end of September, it may be possible to see Mercury, innermost of the planets, low in the southeastern sky just before sunrise. It will be seen best in this position in early October, for on the second it will rise farthest ahead of the sun. Early in September Venus, much more brilliant, may be seen in the same time and place. It is drawing near the sun, passing Mercury on the 23rd, by which time it will hardly be visible.

Also on the 23rd, at 9:44 a. m., EST, the sun, which has been journeying southward through the sky since June 21, will be directly over the equator. This is the autumnal equinox which, for us, marks the beginning of autumn. For countries south of the equator, it is the beginning of spring.

Approximately every 27 1/3 days the moon makes a complete revolution about the earth in a period called the sidereal month. That means it comes back to the same direction among the far distant stars in the background. However, the time between successive full moons, or between

the recurrence of any particular phase, is a little longer. Actually it is about 29 1/2 days and is called the synodic month.

Reason for the difference in the two kinds of months is found in the earth's own movement, once a year, about the sun. As our direction from the sun changes, its direction from us likewise changes. Thus it seems to travel around the sky, from west to east, once every year.

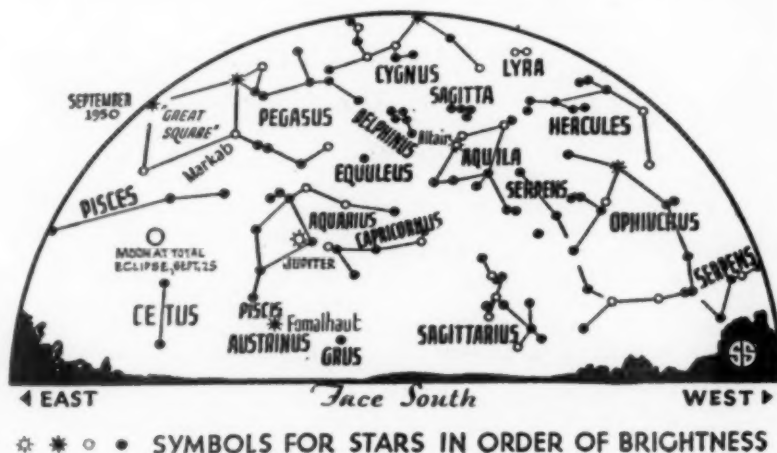
The phase of the moon depends on how nearly it is in the same direction in the sky as the sun. When the two bodies are nearly in the same direction, the moon is new; when they are in opposite directions, the entire sunlit half is turned toward us and we see a full moon. When it is a quarter of the way around the sky from the sun, either to east or west, we see just half of the illuminated hemisphere—or a quarter of the complete moon—and we have the phase of first or last quarter.

Both moon and earth, being solid spheres, cast shadows out into space, though generally they are not apparent. If the plane in which the moon revolves around the earth coincided exactly with that in which our planet travels about the sun, then every time the moon was new its shadow would fall upon the earth, and from the part of our planet where the moon passed in front of the sun there would be a total eclipse of the sun. Similarly, at full moon, our satellite would be entirely in the earth's shadow and there would be a total lunar eclipse.

Shadow Misses Earth

Since the plane of the moon's orbit does not coincide with that of the earth's, but is inclined to it by about five degrees, at most new moons the lunar shadow misses the earth. Similarly, at full moon that body generally passes either north or south of the terrestrial shadow.

Occasionally, however, it happens that the moon is full when it passes through the





earth's orbital plane, and then it does go into our shadow. This will happen on Monday evening, Sept. 25, at the time of the "Harvest Moon," producing a total eclipse visible over practically the whole of the Western Hemisphere.

There are two parts to such a shadow. The inner core, called the umbra, is the true shadow, where the light of the sun is completely obscured. Around this is a region of partial shadow, called the penumbra, from which an observer would see the dark earth partly covering the disk of the sun.

On Sept. 25, at 8:20 p. m., EST, the moon enters the penumbra, but at first so little sunlight is cut off that no noticeable effect will be observed. An hour later, however, the eastern edge of the lunar disk will be noticeably dimmed. At 9:31 this edge makes its first contact with the umbra, as shown at I in the diagram. More than an hour will elapse while the moon catches up with the shadow, which is also moving through the sky toward the east. Then, at 10:54, the moon will be at II, totally eclipsed, remaining so until position III is reached, at 11:40 p. m. At mid-eclipse (11:17) the moon will be at the position indicated on the map, in Pisces, the fishes.

Will Not Disappear

Although in total eclipse, the moon will not disappear from view but will continue to glow with a dull, coppery-red color. Despite the fact that the earth's globe completely eliminates the direct solar rays, some of these are bent by the prismatic action of the terrestrial atmosphere, so that they illuminate the totally eclipsed moon. As sunlight penetrates the atmosphere, some of the blue rays are scattered, to give the daytime sky its blue color. Similarly, at the time of a total lunar eclipse, some light from the sun filters through the earth's atmosphere around the base of the shadow, and is refracted and diffused into the shadow and onto the moon. The red predominates in this light, the same effect that makes the sun look red when it is setting.

If a passenger on a rocket ship had reached the moon in time to be there when a total lunar eclipse happened, he would

be able to see the earth itself totally eclipsing the sun. Around the dark disk of the earth he would see the atmosphere as a brilliant ring of red, an effect that has been reproduced on several occasions in the planetaria of New York, Philadelphia and other cities when they have presented their "Trip to the Moon" show.

After the total eclipse ends, at 11:40 p. m., EST, the northern edge of the moon starts to emerge from the umbra. Again, as during the first partial phases, the curved edge of the shadow of our globe may be seen on the lunar disk. The eclipse ends at 1:02 a. m., Sept. 26, with position IV. For a time the moon will still be noticeably dimmed, until 2:14 a. m., when it is completely clear even from the penumbra, and shines with undiminished brilliance.

This is not the month's only eclipse, though it well might be, for all that most of us will be able to see. Two weeks earlier, on Sept. 11, as the moon is new, its shadow will fall across the earth, tracing out a path from which a total solar eclipse will be visible. It passes close to the North Pole,

across northeastern Siberia, the Aleutian Islands, and ends in the northern Pacific. The sun will be partially eclipsed as seen from northern Asia, including Siberia, China, Korea and Japan, Alaska and a large part of the Pacific Ocean.

Time Table for September

Sept.	EST	
3	5:00 a. m.	Moon farthest distance 251,300 miles
4	8:53 a. m.	Moon in last quarter
10	2:40 p. m.	Moon passes Venus
11	10:29 p. m.	New moon (total eclipse of sun, visible from Asia and N. Pacific)
12	5:21 a. m.	Moon passes Saturn
15	2:00 a. m.	Moon nearest, distance 227,500 miles
	10:00 p. m.	Saturn in line with sun
16	12:13 p. m.	Moon passes Mars
17	3:00 a. m.	Mercury in line with sun
18	3:54 p. m.	Moon in first quarter
23	7:37 a. m.	Moon passes Jupiter
	9:44 a. m.	Sun crosses equator, autumn begins in Northern Hemisphere
	10:00 p. m.	Mercury passes Venus
25	11:21 p. m.	Full moon (Harvest Moon), moon totally eclipsed
30	11:00 p. m.	Moon farthest, distance 251,800 miles

Subtract one hour for CST, two hours for MST, and three for PST.

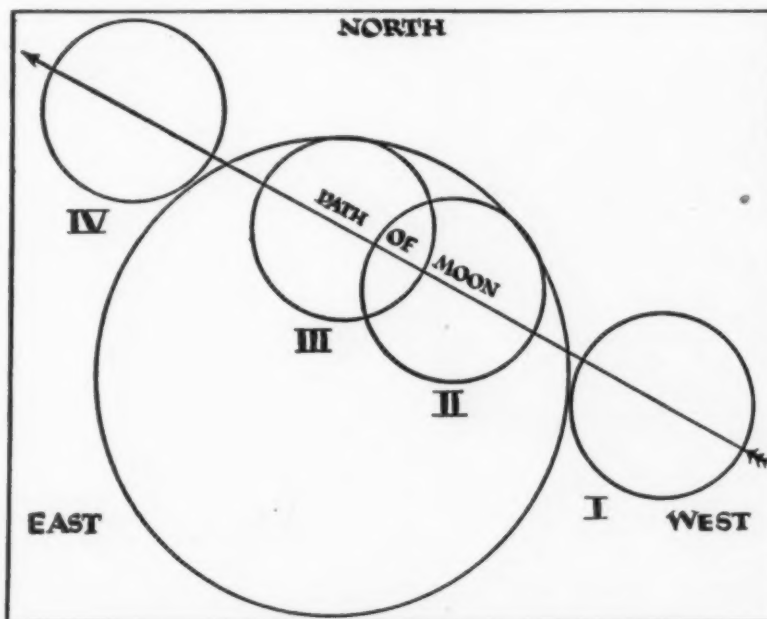
Science News Letter, August 26, 1950

ZOOLOGY

Tuco-Tuco and Armadillo Unusual Zoo Specimens

► LATEST Washington arrivals from Paraguay—at the zoo in Washington, D. C.—are the first specimens to reach there of a little rodent called tuco-tuco, about the size of our ordinary rat, and the three-banded armadillo, about four to five inches long.

Science News Letter, August 26, 1950



PSYCHOLOGY

Special Sights for Dusk

► THE GI crawling through the underbrush to make a dawn attack should have special sights on his rifle to help him get a bead on his enemy.

This is the conclusion of Dr. C. J. Warden, Columbia University psychologist, as a result of experiments on marksmanship with various kinds of sights in dim illumination.

The Springfield or notch type of sight should be abandoned, Dr. Warden recommends. The aperture or ring type of rear sight used on the Garand rifle is far superior under all kinds of light, he found.

But the ring should be larger for dim light as the pupil of the eye expands. The best size is about half the size of the pupil of the eye.

In the Garand sight, a blade mounted near the end of the rifle is lined up with the target and the rifle held so that it is centered in a ring mounted fairly close to your eye. In the Springfield type the blade lined up with the target is centered over a notch in rear sight.

For dim illumination, the blade of the front sight should be bright colored—white, gold, or yellow—and not black as in the regulation rifle. The colors should be dull, however, to prevent glare.

All military rifles should carry two sets

of sights, urges Dr. Warden. They should be mounted so that a flick of the mechanism will turn the right sight into place and the other will be on the reverse side of the barrel out of view.

Aside from permitting greater accuracy, the sights recommended by Dr. Warden cut down on the time required to aim, the difference being as much as two and a half seconds per shot.

Girls taking part in Dr. Warden's experiment developed just as great speed and accuracy in firing as did the men tested.

Some 23 of the 33 persons who took part in the experiment had experience with shooting, ranging from two hours of hunting to boot training in the Navy or basic training in the infantry. This group made slightly better scores in the experiments than did the inexperienced, but the difference was not large enough to be significant. Dr. Warden explains this on the basis of the training given preliminary to the experiment.

Dr. Warden urges further investigation to find out whether the standard Garand sights could be improved for ordinary daylight use. Details of his investigation are published in the *JOURNAL OF GENERAL PSYCHOLOGY* (April).

Science News Letter, August 26, 1950

denser of stainless steel, capable of withstanding the rigorous task of condensing sulphite liquor.

Sulphite liquor looks like black coffee and contains from 8% to 12% of solids. For processing, it is run through long vertical tubes in the condenser under high temperatures. The water comes off as steam and the liquor is boiled down to about one-fifth its original volume. The evaporated material, half water and half solids, has the consistency of molasses and under proper furnace conditions it can be burned.

A number of problems such as techniques of burning and of disposing of the fluffy ash that results remain to be solved. The problems differ in detail for each sulphite pulp mill.

Science News Letter, August 26, 1950

CHEMISTRY

British Use Color Test To Reveal Carbon Monoxide

► THE STANDARD British method of detecting the presence of poisonous carbon monoxide gas in the air in factories, garages and homes is now a war-developed process, which utilizes a small tube containing silica gel and a yellow reagent that is stained by the gas.

If carbon monoxide is present in the air drawn through the tube, even in very small quantities, the reagent is discolored. A dark brown stain appears at the junction of it and the gel. The length of the stain gives a measure of the amount of carbon monoxide in the air.

The adoption of this method as standard is announced in a recent publication of the British Department of Scientific and Industrial Research. Several methods of detecting carbon monoxide are presented in the leaflet but this war-developed method is described as best to give a rapid indication of the relative safety of the atmosphere.

The industrial tube recommended by the government agency is relatively small in size and has plain silica gel at each end with the yellow reagent between. This reagent is potassium pallado-sulphite. Air to be tested is forced through the tube by a rubber bulb. The function of the gel is merely to remove condensable vapors.

A version of this same carbon monoxide detector is in use in the United States. It was developed by the National Bureau of Standards and widely used during the war. The American government institution gave full credit to the British for the invention but its version, it claims, is more sensitive and better adapted to field conditions.

The Bureau of Standards describes its detector as using a yellow silica gel impregnated with a complex molybdate compound and catalyzed by means of palladium sulfate. The yellow mixture turns green if carbon monoxide is present in the air passed through it.

Science News Letter, August 26, 1950

CHEMISTRY

Fuel from Paper Mill Waste

► WASTE liquor from the paper industry's sulphite pulp mills—long Wisconsin's No. 1 industrial water pollution problem—may turn out to be a valuable "coal mine," if experiments by the Sulphite Pulp Manu-

facturers' Research league in Appleton, Wis., continue to be successful.

Scientists of the league, operated by paper mill owners, assert that the 1,400 tons of wood solids dissolved in the sulphite liquor produced daily in the state could become the equivalent of about half that many tons of coal if the sulphite-fuel theory can be worked out to become completely practical.

"Primary incentive behind the research is to find some economical method of getting rid of the sulphite liquor instead of flowing it into the streams," said J. M. Holderby. He recently resigned as director of the league to join the technical staff of the Rhinelander Paper Co., at Rhinelander, Wis., which is conducting experiments on the disposal of sulphite waste. "The waste material contains sugars, which decrease the oxygen dissolved in the stream water into which it goes. This makes the environment less desirable for fish life, and, under extreme conditions, drives fish out of the area," Mr. Holderby explained.

While studying paper making methods in Europe last fall, three league researchers found that Swedish mills were using a small amount of sulphite as fuel. Back in this country, they imported a Swedish con-



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HOLTER RESEARCH FOUNDATION

Helena, Montana

PSYCHOLOGY

Character Tops Looks

► **GOOD CHARACTER** and not good looks is considered most important by mentally healthy college students in picking a wife or a husband. This was shown by a survey of 118 well adjusted college men and the same number of college girls asked to indicate traits most essential and those least essential in a future mate.

In fact, beauty or good looks is rated as least essential by one out of four men and by two thirds of the girls surveyed.

Men and women are agreed in placing moral character, similarity of interests and intelligence at the top of the list of traits essential in a potential mate.

No one of either sex regarded education or congenial in-laws as most essential. No girls placed a top rating on good looks in a potential husband although 1.78% of the men consider it of top importance in a future wife.

In spite of minimizing the importance of education, a great majority (77% of the men and 92% of the girls) believe that a college woman should marry a college man. A somewhat smaller percentage (52% of the men, 66% of the women) think that a college man should marry a college woman.

Among both college girls and college men, college students are preferred for dates, the percentage with this preference being higher for girls than for men. But they had different reasons. The girls like the college date because "the college man is more mature," has "better prospects for the future" or "has more knowledge of what is going on in the world."

The college man likes to date college girls because they are "more level-headed," "more intelligent," or "more pleasant."

The few girls who prefer the business man date do so because they think him "more mature," "more independent," "more responsible." Most of the men who prefer the business date have nothing good to say about her, but they do not like the college girl, believing her "too smart for her own good," "too conceited," "too intellectual," "too snobbish."

Report of the survey by Drs. James P. Vail and Virginia M. Staudt, of Fairfield University, Fairfield, Conn., and Notre Dame College, Staten Island, N. Y., is contained in the JOURNAL OF PSYCHOLOGY (July).

Science News Letter, August 26, 1950

MEDICINE

Balloon Detects Cancer

► A **FOUR-INCH** long balloon with tiny silk brushes on the outside may help in better detection of stomach cancer. This is one of the most difficult of all cancers to diagnose in time to save the patient.

The silk brush balloon was designed by Drs. Frederick G. Panico, George N. Papanicolaou and William A. Cooper of Cornell University Medical College and Bellevue Hospital, New York. They announced it in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Aug. 12) in Chicago.

The idea is to brush from the stomach lining some of the loose cells shed by the cancer. These cells stick to the ends of silk which form the brush and are withdrawn with the balloon. They can then be transferred to glass slides and examined under the microscope.

Dr. Papanicolaou has previously shown that cancers shed cells and that if these can be washed or wiped off the body tissue they can be used for diagnosing cancer. With stomach cancer, it has been difficult to get any of the cells out of the stomach.

The abrasive action of the silk brush balloon does a better job of getting cells out for examination than other methods, Dr. Papanicolaou and associates find. Normal stomach lining resists having its cells brushed off.

The balloon needs to be perfected, though

in routine use it may not give as accurate results as in the test studies. But the results, the New York group believes, "give some basis for optimism" with regard to such a method for detecting stomach cancer.

For best results, the stomach must be empty and clean before the brush balloon is used. And the method cannot be used on patients with active bleeding from stomach or upper digestive tract.

The 70 patients on whom the new device was tried were put on a liquid diet the day before the test. The stomach contents were sucked out by stomach tube the night before. The balloon was swallowed uninflated the next morning. Then it was slowly inflated and moved back and forth so that the brushes would come in contact with all parts of the stomach. This was repeated five or more times during an hour. "Slight discomfort" was felt when the balloon went down the back of the throat.

Science News Letter, August 19, 1950

ASTRONOMY

Second Nova Found In Southern Sky

► A **NOVA** or exploding star has blazed forth in the southern sky close to where another nova of the same brilliance appeared on July 20.

Reported to Harvard Observatory from Mexico's Tonanzintla Observatory by Dr. G. Haro, director, the most recent "new star" was found on a photograph taken Aug. 7. Its announcement was held up because of fear that there was confusion with the earlier outburst that was discovered by Dr. Fritz Zwicky of Palomar Observatory, California. Both novae were 7.5 magnitude upon discovery, but the Zwicky nova has now faded to 11th magnitude.

The positions of the two stars are less than a degree apart, but that does not mean that they are actually close together in space or that the two explosions are connected in any way. Both novae are in the constellation of Scorpio.

A star of 15th magnitude, which is very faint, has been discovered on earlier photographs in the exact location of the Zwicky nova. This faint star which presumably became bright was found on plates at both Harvard's South African station and the University of Michigan Observatory.

Science News Letter, August 26, 1950

Some of the giant *tank ships* that carry crude oil and petroleum products will hold as much as 10,000,000 gallons.

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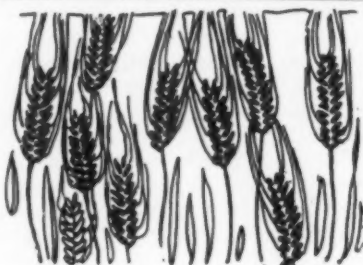
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BOTANY

NATURE RAMBLINGS



Wheat

➤ ACROSS a million fields the combines clank and clatter, their cutting bars flashing in the sun. Dusty, sweating crews of men, following a golden river northward, cut a giant swath across the plains. Wheat is coming in . . . wheat, the most triumphant of all grasses, upon whose bountiful kernels western civilization has grown for 7,000 years.

Into overflowing bins and towers, into vast hangars once echoing with the roar of U. S. war-time might, into rusting Liberty ships lying at permanent moorings, flows the endless stream of grain, too much for 150,000,000 people, too much for sleek cattle and tubby hogs.

Seedtime and harvest, surplus and shortage. The cycle is that of civilization itself. Civilization built itself on wheat.

The earliest inscriptions on the tombs of ancient Egypt and Mesopotamia show that the peoples of prehistory fed largely on

two grains, barley and wheat. Barley came first, but wheat was not far behind. From these grains both bread and beer were made.

Wheat must have been cultivated around the earliest campfire settlements, long before the Pharaohs. Kernels have been found in ancient places where they fell 5,500 years ago. The earliest wheat on record was already a cultivated, improved grass.

In those settlements, resurrected by archaeologists, have been found the tools of grain: sickles of baked pottery, others made of wood or bone edged with sharp flakes of flint. In the age of bronze came the earliest scythes of metal. Men grew wheat while still hunting the wild animal for meat and winter clothing.

Yet wheat today is so unlike any common wild grass that for a long time it was thought the parent plant, the original wild species, was extinct. But shortly before the first World War, a brilliant young Jewish botanist named Aaronsohn discovered wild wheat growing on Mount Carmel in Palestine.

The grain stem he discovered is unlike cultivated wheat. The central stem of its head, from which the kernels sprout, was so brittle that it crumbled into pieces when the grain was ripe. It could not be harvested or threshed by modern means, nor perhaps even by the hand methods of primitive peoples.

But in their cultivation, men of the Stone Age practiced plant improvement in some unrecorded way, producing a solid head on wheat many centuries before their wise men learned to write down the story of their exploit.

It is still that golden, waving grass by which men and nations measure wealth and power. On the Great Plains the wheat is in. The staff of life is being harvested.

Science News Letter, August 26, 1950

• Books of the Week •

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THE ABC OF ACID-BASE CHEMISTRY: The Elements of Physiological Blood-Gas Chemistry for Medical Students and Physicians—Horace W. Davenport—University of Chicago Press, 3rd ed., 86 p., illus., paper, \$2.00 A guide book brought up-to-date.

AETIOS OF AMIDA: The Gynaecology and Obstetrics of the VIth Century, A.D.—James V. Ricci, Translator—Blakiston, 215 p., \$7.00. Dr. Ricci has translated the Latin version by Cornarius of the last chapter in the encyclopedia of medicine on obstetrics and diseases of women written originally by Aetios of Amida, Court physician to Justinian I, Emperor of Byzantium.

THE AMERICAN RED CROSS: A History—Foster Rhea Dulles—Harper, 554 p., \$5.00. The general history of the American Red Cross covering operations during the past seventy years.

BIRD NOTES FROM BARRO COLORADO ISLAND, CANAL ZONE—Josselyn Van Tyne—University of Michigan Press, 12 p., illus., paper, 25 cents.

BIRD'S-EYE VIEW OF THE PUEBLOS—Stanley A. Stubbs—University of Oklahoma Press, 122 p., illus., \$3.00. A guide to the Indian villages of New Mexico and Arizona, with aerial photographs and scale drawings.

CANADA GEESE OF THE MISSISSIPPI FLYWAY: With Special Reference to an Illinois Flock—Harold C. Hanson and Robert H. Smith—Natural History Survey Division, approx. 143 p., illus., paper, free upon request to publisher, Urbana, Illinois. A report of a study made of a flock of Canada geese wintering in Alexander County, Illinois.

THE CHILD WHO NEVER GREW—Pearl S. Buck—Day, 62 p., \$1.00. A mother's account of

the problems in rearing her mentally retarded child.

CLASSICAL MECHANICS—Herbert Goldstein—*Addison-Wesley*, 399 p., illus., \$6.50. A text evolving from a course of lectures on classical mechanics given by author at Harvard University. Primarily designed for a graduate physics course.

CONTROLLED ACCESS EXPRESSWAYS IN URBAN AREAS: A Symposium—Committee on Controlled Access Expressways in Urban Areas—*Highway Research Board*, 41 p., illus., 60 cents. A study of the many problems involved in relieving city traffic congestion by this method.

THE EFFECTS OF ATOMIC WEAPONS—Samuel Glasstone, Executive Editor—*Combat Forces*, 456 p., illus., \$3.00. A cloth bound edition of a handbook identical with the original edition published by the Government Printing Office (See SNL, Aug. 19).

THE FATIGUE STRENGTH OF VARIOUS TYPES OF BUTT WELDS CONNECTING STEEL PLATES—Wilbur M. Wilson, William H. Munse and I. Sterling Snyder—*University of Illinois*, 60 p., illus., 50 cents. The results of numerous tests conducted by the Engineering Experiment Station.

FERTILIZERS—*Food and Agriculture Organization of the United Nations*, 24 p., illus., paper, 25 cents. A commodity report on the use of fertilizers throughout the world.

HIGH-FIDELITY TECHNIQUES—James R. Langham—*Radcraft*, 112 p., illus., paper, \$1.00. A guide for amateur audio-engineers.

HOW TO SAVE \$1000 A YEAR AT HOME AND HAVE FUN DOING IT—Margaret Gaddis—*Cummings Enterprises*, 96 p., illus., paper, \$1.00. Various helpful hints and suggestions on saving money for those with modest incomes.

IMPACT OF SCIENCE ON SOCIETY, Vol. I, No. 1—*UNESCO* (Paris), quarterly, 33 p., 50 cents per year for the first year, \$1.00 for the second year, single copy 25 cents. A quarterly bulletin devoted to abstracts in the field of the social and international implications of science.

INPUT IMPEDANCE OF A SLOTTED CYLINDER ANTENNA—Charles A. Holt—*University of Illinois*, 50 p., illus., paper, 40 cents. A report from the Engineering Experiment Station on the use of the slot-cylinder antenna for frequency-modulated broadcasting and television.

LECTURES ON CLASSICAL DIFFERENTIAL GEOMETRY—Dirk J. Struik—*Addison-Wesley*, 221 p., illus., \$6.00. This book has developed from a one-term course given by the author for upperclassmen and graduate students at the Massachusetts Institute of Technology.

LECTURES ON FOUNDATION ENGINEERING GIVEN AT THE UNIVERSITY OF ILLINOIS, 1941-1942—A. E. Cummings—*University of Illinois*, 142 p., illus., paper, \$1.00.

LIQUID-METALS HANDBOOK: A Guide to the Use of Liquid Metals as Heat-Transfer Media—Richard N. Lyon, Editor-in-Chief—*Gov't. Printing Office*, 188 p., illus., paper, \$1.25. A reference book on liquid metals sponsored by the Committee on Basic Properties of Liquid Metals, Office of Naval Research in collaboration with the Atomic Energy Commission and the Bureau of Ships.

LOOKING AT SCIENTIFIC RESEARCH IN MELLON INSTITUTE 1949-1950—E. R. Weidlein, Director—*Mellon Institute of Industrial Research*, 48 p., illus., paper, free upon request to publisher, Univ. of Pittsburgh, Pittsburgh 13, Pa. The 37th annual report discusses present happenings and future goals of the Mellon Institute.

MOMENTS IN TWO-WAY CONCRETE FLOOR SLABS—Chester P. Siess and Nathan M. Newmark—*University of Illinois*, 124 p., illus., paper, 60 cents. A report of an investigation conducted by the Engineering Experiment Station.

NEIGHBORS IN ACTION: A Manual for Local Leaders in Intergroup Relations—Rachel Davis DuBois—*Harper*, 294 p., \$3.00. A report growing out of a project in intergroup relations carried on in one of New York City's most culturally mixed neighborhoods.

NEW HANDBOOK OF THE HEAVENS—Hubert J. Bernhard, Dorothy A. Bennett and Hugh S. Rice—*New American Library*, 239 p., illus., paper, 35 cents. A guide to the stars for the amateur. Cloth bound edition was originally published by McGraw-Hill.

NUCLEAR PHYSICS: A Textbook—Francis Bitter—*Addison-Wesley*, 200 p., illus., \$5.00. A textbook intended for students who have had a course in atomic theory in addition to the usual introductory physics course.

OWLS—Herbert S. Zim—*Morrow*, approx. 62 p., illus., \$2.00. Discusses the owl and his many remarkable traits. Written for juveniles with excellent illustrations by James Gordon Irving.

THE PEOPLE OF GREAT RUSSIA: A Psychological Study—Geoffrey Gorer and John Rickman—*Chanticleer*, 235 p., \$3.00. An attempt by an anthropologist to arrive at an understanding of these people based on a study of their cultural traditions and methods of child care and in part on anecdotal accounts by a rural physician who worked in Russia for the Friends' War Victims Relief Unit.

PRINCIPLES AND PRACTICE OF SPECTROCHEMICAL ANALYSIS—Norman H. Nachtrieb—*McGraw-Hill*, 324 p., illus., \$4.50. Covers chemical-emission spectroscopy in the ultraviolet and visual regions of the spectrum. A college text.

PSYCHIATRY FOR SOCIAL WORKERS—Lawson G. Lowrey—*Columbia University Press*, 2nd ed., 385 p., \$4.50. A revised guide to aid social workers to recognize the symptoms of psychiatric disorders.

REVIEW OF LITERATURE ON DUSTS—J. J. Forbes, Sara J. Davenport and Genevieve G. Morgis—*Gov't. Printing Office*, U. S. Dept. of Interior Bull. No. 478, 333 p., illus., paper, 65 cents. Discussion of the incidence, effects, determination and control of dusts.

THE STORY OF A STANLEY STEAMER—George Woodbury—*Norton*, 256 p., illus., \$3.00. The "biography" of the last model of a Stanley Steamer made by the Stanley Brothers.

STRATEGY IN POKER, BUSINESS AND WAR—John McDonald—*Norton*, 128 p., \$2.50. The editor of "Fortune" applies the mathematical theory of games developed by the atomic scientist, John von Neumann and Oskar Morgenstern to such social situations as poker, super markets, and atomic warfare. Written in non-mathematical language for the person who wants to gain understanding of our daily life.

STUDIES OF HIGHWAY SKEW SLAB-BRIDGES WITH CURBS, Part II: Laboratory Research—Myron L. Gossard and others—*University of Illinois*, 79 p., illus., 45 cents. A report on laboratory tests conducted by the Engineering Experiment Station of four skew slab-bridge models of reinforced concrete.

SURGICAL NURSING—Eldridge L. Eliason, L. Kraefer Ferguson and Lillian A. Sholtis—*Lippincott*, 9th ed., 728 p., illus., \$4.00. The treatment of surgical diseases and the social, economic and public health aspects of these diseases are presented.

THE TREES OF PENNSYLVANIA—William Carey Grimm—*Stackpole and Heck*, 363 p., illus., \$5.00. A well-illustrated manual designed for the layman so that he might recognize trees native to this state, as well as most of the more common ones.

THE TSUNAMI OF APRIL 1, 1946—F. P. Shepard, G. A. MacDonald and D. C. Cox—*University of California Press*, approx. 135 p., illus., paper, \$1.75. A report of the most disastrous attack of long period gravity ocean waves in the history of the Hawaiian Islands.

UNITED NATIONS INTERNATIONAL CONTROL OF ATOMIC ENERGY—General Assembly—*United Nations* (U. S. Distributor: Columbia University Press), 37 p., paper, 30 cents. Official records of the resolutions, reports and statements made in this fourth Session of the General Assembly.

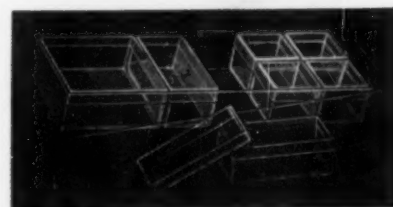
UNITED STATES ARMY COMBAT FORCES JOURNAL, Vol. I, No. 1—Joseph I. Greene, Ed.—*Association of the United States Army*, monthly, \$5.00 per year in U. S., \$6.00 foreign payable in advance, single copies 50 cents. A merger of the Infantry Journal and the Field Artillery Journal. The chief purpose of this new journal is to support and improve combat efficiency through discussion and suggestion.

UNITED STATES GOVERNMENT ORGANIZATION MANUAL 1950-51—Federal Register Division—*Gov't. Printing Office*, 657 p., illus., paper, \$1.00. Describes the agencies in the legislative, judicial and executive branches and various international organizations. Revised as of July 1, 1950.

Science News Letter, August 26, 1950

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☼ **HELMET** for use in the showerbath, on which the government has recently issued a patent, is big enough to cover head, face and hair loosely with its lower edge resting on the shoulders. It is made of a stiff transparent material, and has breathing openings covered by shields.

Science News Letter, August 26, 1950

☼ **ENVELOPE SEALER**, to wet the adhesive on the flaps, has a plastic casing within which is a sponge roller, and a handle which supplies water for wetting. The handle is a flexible plastic, which is easily filled with water and from which the water is released to the roller by a light squeeze.

Science News Letter, August 26, 1950

☼ **SCREWDRIVER** for electricians and automobile mechanics has a replaceable tiny neon tube within its shock-free plastic handle which lights when the blade contacts a high-voltage circuit. The neon tube is placed under a transparent cover in a slot in the black handle.

Science News Letter, August 26, 1950

☼ **DRAPERY PLEATERS**, shown in the picture, are zinc-plated steel pins for home use with which perfect pinch or box pleats can be made. They come in sets, each con-



taining 10 pleaters, four brass pin hooks for curtain ends, and two patterns with instructions.

Science News Letter, August 26, 1950

☼ **TAILGATE LOADER** for pickup trucks, which can lift from ground to truck-floor-level a 1000-pound package on its elevator-like platform, is powered by a

fan-belt driven hydraulic pump on its own self-contained clutch. When not in use as an elevator, it can serve to lengthen the floor of the truck.

Science News Letter, August 26, 1950

☼ **PROTECTIVE MASKS** for workers in dust-laden industrial atmosphere consist of aluminum shields, to fit over nostrils and mouth, within which are replaceable filters of extra thickness. Masks weigh less than a half-ounce and are said to be cooler than other types.

Science News Letter, August 26, 1950

☼ **BRANDING IRON** for range livestock is electrically heated from an ordinary household outlet, a portable generator or the battery of a truck or tractor. It is designed to replace older irons heated on an open fire. Different branding heads may be used on this recently patented device.

Science News Letter, August 26, 1950

☼ **REFLECTIVE FABRIC** to help keep the body warm is made of cotton fibers treated with aluminum pigment. When woven into cloth, these fibers reflect radiant heat. Clothing made from the cloth would send heat from the body back to the body instead of permitting its escape.

Science News Letter, August 26, 1950

Do You Know?

Sugar helps hold the flavor and texture of fruits in canning or freezing.

Some fish in streams eat seeds dropped from trees overhanging the water.

A dairy cattle breed may produce meat just as high in quality as that from a beef breed.

An analysis of quail crops shows these birds eat seeds from over 300 different plants.

Females have a change in voice during adolescence somewhat similar to the change in male voices.

Adults are partial to rose-like smells, according to a scientist studying people's likes and dislikes in odors; children lean to spearmint and other strong, simple odors.

To protect the California condor from extinction, the U.S. Government is considering a plan to set aside 32,000 acres of land in the Los Padres National Forest as a condor sanctuary.

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